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Attorney Docket No.: 10002592-1

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Schut  
Serial No.: 09/866,059  
Filing Date: May 25, 2001  
Title: UNDERPRINTING COMPONENT FOR ENHANCING INK STABILITY IN PRINTING

Examiner: Woodward  
Art Unit: 1711

Assistant Commissioner for Patents  
Washington, DC 20231

Sir:

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**RESPONSE TO OFFICE ACTION UNDER 37 C.F.R. §1.111**

This **Response to Office Action** is filed in response to the Office Action mailed October 24, 2002, rejecting claims 1-6 and 8. The following amendments and remarks remove all grounds for rejection of the application, thereby placing it in condition for allowance.

**Amendment**

Please amend the claims as follows:

1. (amended once) An additive for a printing vehicle, comprising:
- a block co-polymer comprising
  - a first block comprising a pendant group selected to interact with a substrate via an interaction selected from hydrogen bonding, pi-bond interactions, Van der Waals forces, and any combination of the above; and
  - a second block comprising a moiety selected from an acidic, basic, charged, and chargeable moiety,
- wherein the first block comprises at least 6 pendant groups and the second block comprises at least 6 of said moieties.

8.(amended once) The additive of claim 1, wherein the second block comprises a polymer selected from poly(ethylene imine), methylated poly(ethylene imine), poly(diallyldimethylamino chloride), polymerized styrene maleic anhydride, and a polymer having a pendant group including a carboxylic acid.

No new matter is entered by any of these amendments. A marked-up version of the amendments to the specification and claims is included in the attachment captioned "Version with Markings to Show Changes Made for USSN 09/866,059".

## Remarks

### Rejections under 35 U.S.C. 112 ¶1

Claims 1-6 and 8 stand rejected under 35 U.S.C. 112 ¶1 for not enabling one skilled in the art to make the block copolymer recited in the claims. Applicant respectfully disagrees. Both blocks of the co-polymer described in Example 1 are well known polymers. Applicant submits that one skilled in the art is familiar with a variety of techniques for connecting these two blocks. As is well known by those skilled in the art, poly(vinyl alcohol) (PVA) is formed by producing poly(vinyl acetate) and removing the acetate groups by hydrolysis. Before hydrolysis, the acetate groups are available to perform a variety of chemical reactions either as acetate groups or after conversion to leaving groups such as hydroxyl or a halogen such as chlorine or bromine. For example, a linker having one end that is reactive with the acetate group or that can substitute for a leaving group and one end reactive with the amine endgroup on the poly(ethylene imine) (PEI) block may be used to connect the two blocks together. Alternatively, the two blocks may be connected directly using condensation reactions. One skilled in the art is familiar with a variety of protecting groups and leaving groups that may be exploited for this purpose. Exemplary reactions are described in standard organic chemistry texts, such as *Advanced Organic Chemistry* (Carey and Sundberg, 1990, New York: Plenum Press). As a result, Applicant submits that claims 1-6 and 8 meet the requirements of 35 U.S.C. 112 ¶1.

### Rejections under 35 U.S.C. 112 ¶2

Claims 1-6 and 8 stand rejected under 35 U.S.C. 112 ¶2 as being indefinite. Applicant submits that the amendments to claims 1 and 8 place the claims in condition for allowance.

The Examiner states that the term "vehicle" in claim 1 is indefinite. Applicant submits that "vehicle" is a term of art indicating a liquid mixture that is deposited on a print medium with various components to achieve print quality and durability. An ink vehicle additionally deposits ink on a substrate. See, for example, page 2, lines 17-19 and Example 1 for descriptions of the function and composition of exemplary ink and underprinting vehicles that may be used with the invention.

The Examiner further states that the metes and bounds of the first and second blocks of the block co-polymer are indeterminate in scope. Applicant respectfully disagrees. Applicant submits that one skilled in the art will understand that a block is a polymerized segment of a polymer chain. A pendant group hangs off the polymer backbone. For example, a hydroxyl group is the pendant group in PVA. In claim 1, the pendant groups on the first block are limited to chemical groups that are susceptible to the specific non-covalent interactions recited in the claim. The polymer of the second block is limited to those having a chargable, charged, acidic, or basic groups either in the polymer backbone or in a pendant group. One skilled in the art will understand that the second block is required to have a chemical moiety that may be ionized or that has a hydrogen or hydroxyl group that may be removed from the moiety at a given pH, leaving a charged group behind. As a result, Applicant submits that claims 1-6 and 8 meet the requirements of 35 U.S.C. 112¶2.

In light of the foregoing Amendment and Remarks, Applicant respectfully submits that the present case is in condition for allowance. A Notice to that effect is respectfully requested.

Please charge any fees associated with this filing, or apply any credits, to our Deposit Account No. 08-2025.

Respectfully submitted, 11/4/03

*W. Bradley Haymond*

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Dated:

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Additions are in bold face and deletions are struck out.

In the claims

1.(amended once) An additive for a printing vehicle, comprising:

a block co-polymer comprising

a first block comprising a pendant group selected to interact with a substrate via a ~~member of an interaction selected from~~ hydrogen bonding, pi-bond interactions, Van der Waals forces, and any combination of the above; and

a second block comprising a **moiety selected from** ~~member of an~~ acidic, basic, charged, and chargeable moiety,

wherein the first block comprises at least 6 pendant groups and the second block comprises at least 6 ~~acidic or basic~~ **of said** moieties.

8. (amended once) The additive of claim 1, wherein the second block comprises a **polymer selected from** ~~member of~~ poly(ethylene imine), methylated poly(ethylene imine), poly(diallyldimethylamino chloride), polymerized styrene maleic anhydride, and a polymer having a ~~carboxylated~~ pendant group **including a carboxylic acid**.

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1711  
PATENT APPLICATION

ATTORNEY DOCKET NO. 10002592 -1

IN THE  
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): David M. Schut

Confirmation No.: 4177

Application No.: 09/866059

Examiner: Woodward

Filing Date: May 25, 2001

Group Art Unit: 1711

Title: Under-/Overprinting Fluid Component For Enhancing Ink Stability In Printing

COMMISSIONER FOR PATENTS  
Washington, D.C. 20231

TRANSMITTAL LETTER FOR RESPONSE/AMENDMENT

Sir:

Transmitted herewith is/are the following in the above-identified application:

- (X) Response/Amendment ( ) Petition to extend time to respond  
( ) New fee as calculated below ( ) Supplemental Declaration  
(X) No additional fee (Address envelope to "Box Non-Fee Amendments")  
( ) Other: \_\_\_\_\_ (fee \$ \_\_\_\_\_)

CLAIMS AS AMENDED BY OTHER THAN A SMALL ENTITY						
(1) FOR	(2) CLAIMS REMAINING AFTER AMENDMENT	(3) NUMBER EXTRA	(4) HIGHEST NUMBER PREVIOUSLY PAID FOR	(5) PRESENT EXTRA	(6) RATE	(7) ADDITIONAL FEES
TOTAL CLAIMS	15	MINUS	20	= 0	X \$18	\$ 0
INDEP. CLAIMS	1	MINUS	3	= 0	X \$84	\$ 0
[ ] FIRST PRESENTATION OF A MULTIPLE DEPENDENT CLAIM					+ \$280	\$ 0
EXTENSION FEE	1ST MONTH \$110.00	2ND MONTH \$410.00	3RD MONTH \$930.00	4TH MONTH \$1450.00		\$ 0
OTHER FEES						\$
TOTAL ADDITIONAL FEE FOR THIS AMENDMENT						\$ 0

Charge \$ 0 to Deposit Account 08-2025. At any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. ~~A duplicate copy of this sheet is enclosed.~~

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231.

Date of Deposit: 11/14/03

Typed Name: W. Bradley Haymond

Signature: *W. Bradley Haymond*

Respectfully submitted,

David M. Schut

By *W. Bradley Haymond*

W. Bradley Haymond

Attorney/Agent for Applicant(s)

Reg. No. 35,186

Date: 11/14/03